

01



DEEPFAKES AND THE ARTWORLD

EPFL
EE550

Student
Ludovica
Schaerf

Autumn,
2020



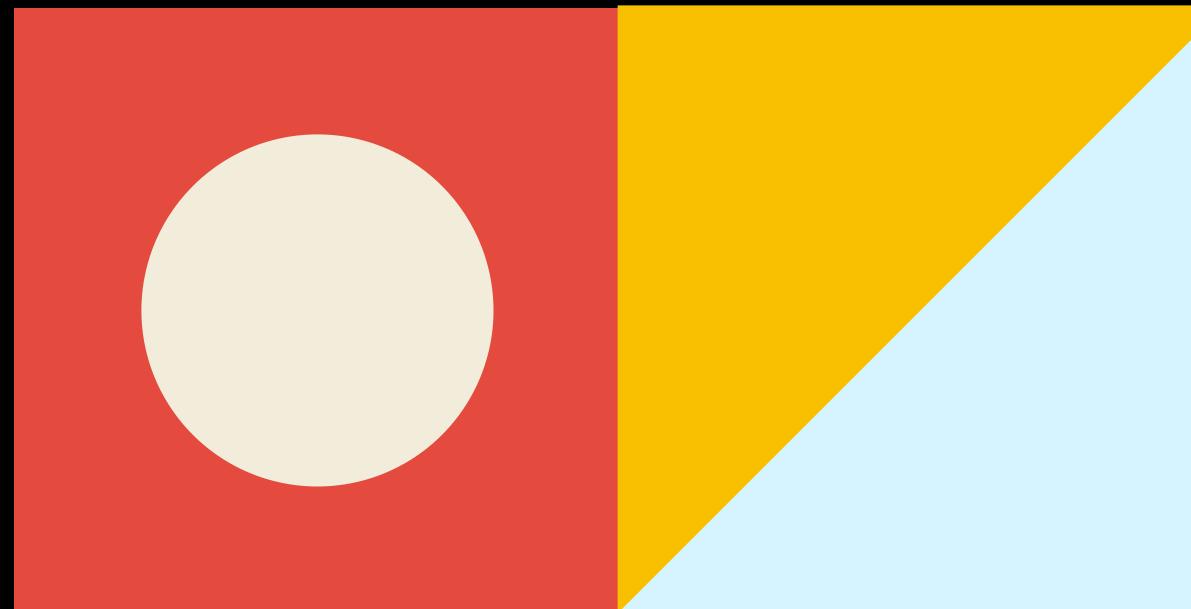
Target → Landmarks → Result



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OUTLINE



- 01** Context and Motivation
- 02** Generic Pipeline
- 03** Case Studies
- 04** Challenges
- 05** Discussion
- 06** Conclusion

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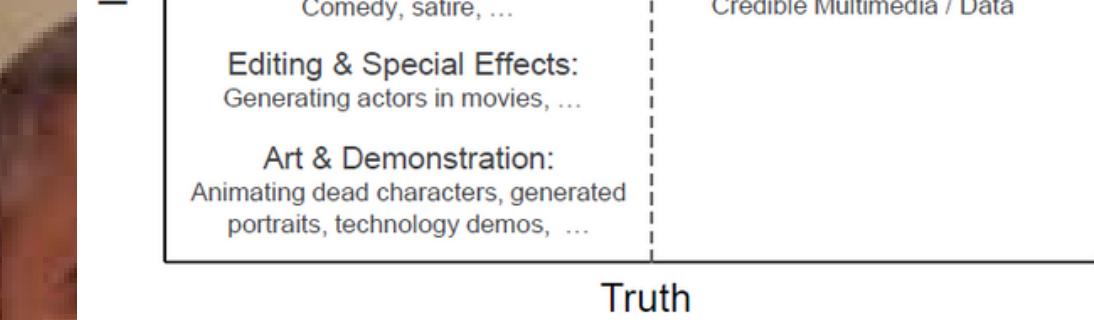


Application

porn
politics
movies
art
social media

Type

pictures
videos
audios



@Life2Coding

DeepFakes

04



MOTIVATION

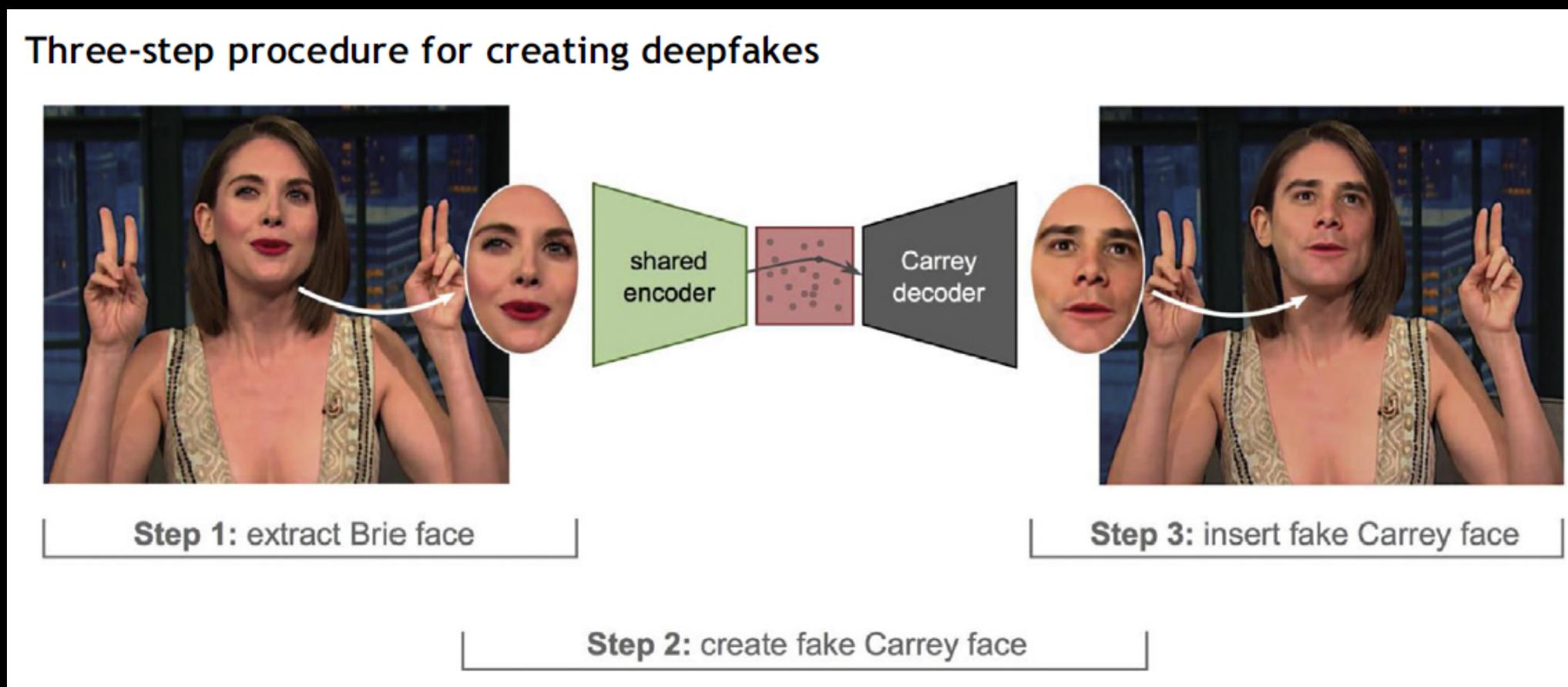
But deepfakes can also be positive

- Produce new art
- Engage audiences
- Offer a social commentary

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GENERIC PIPELINE



Kietzmann et al. (2020).

Data Gathering

Source -Target
Other data

Preprocessing

Image segmentation
Landmark detection

Modeling

Autoencoders
Generative Adversarial Networks

Postprocessing

Blending
Sharpening

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→ In event of moon disaster



"In Event of Moon Disaster",
22nd November 2019 at the
International Documentary Film
Festival Amsterdam (IDFA),
MIT

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MOON DISASTER PIPELINE

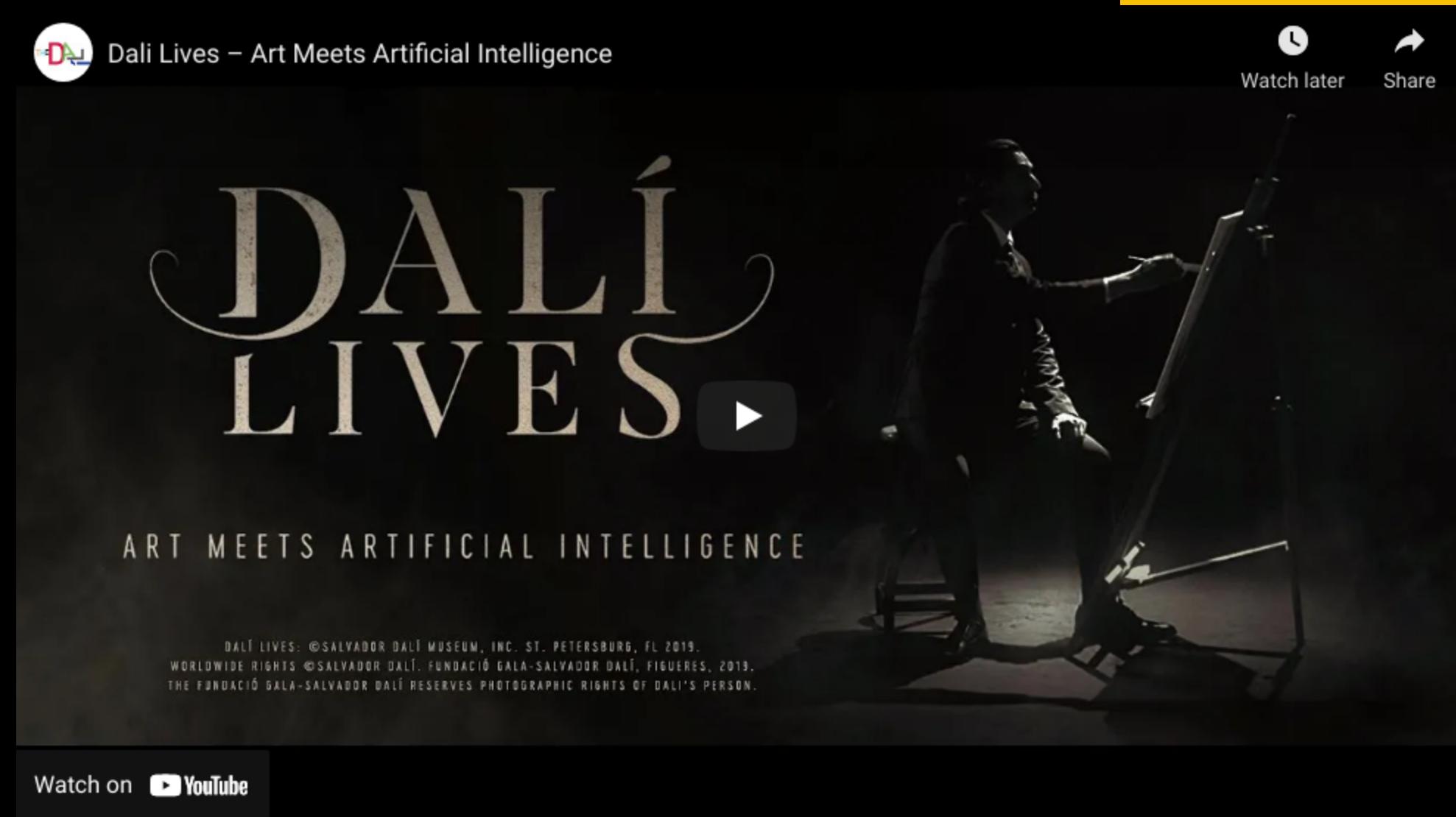
'Video Dialogue Replacement' tool
CannyAI

Target video: Nixon's resignation
speech

Target audio: Nixon's Vietnam speeches

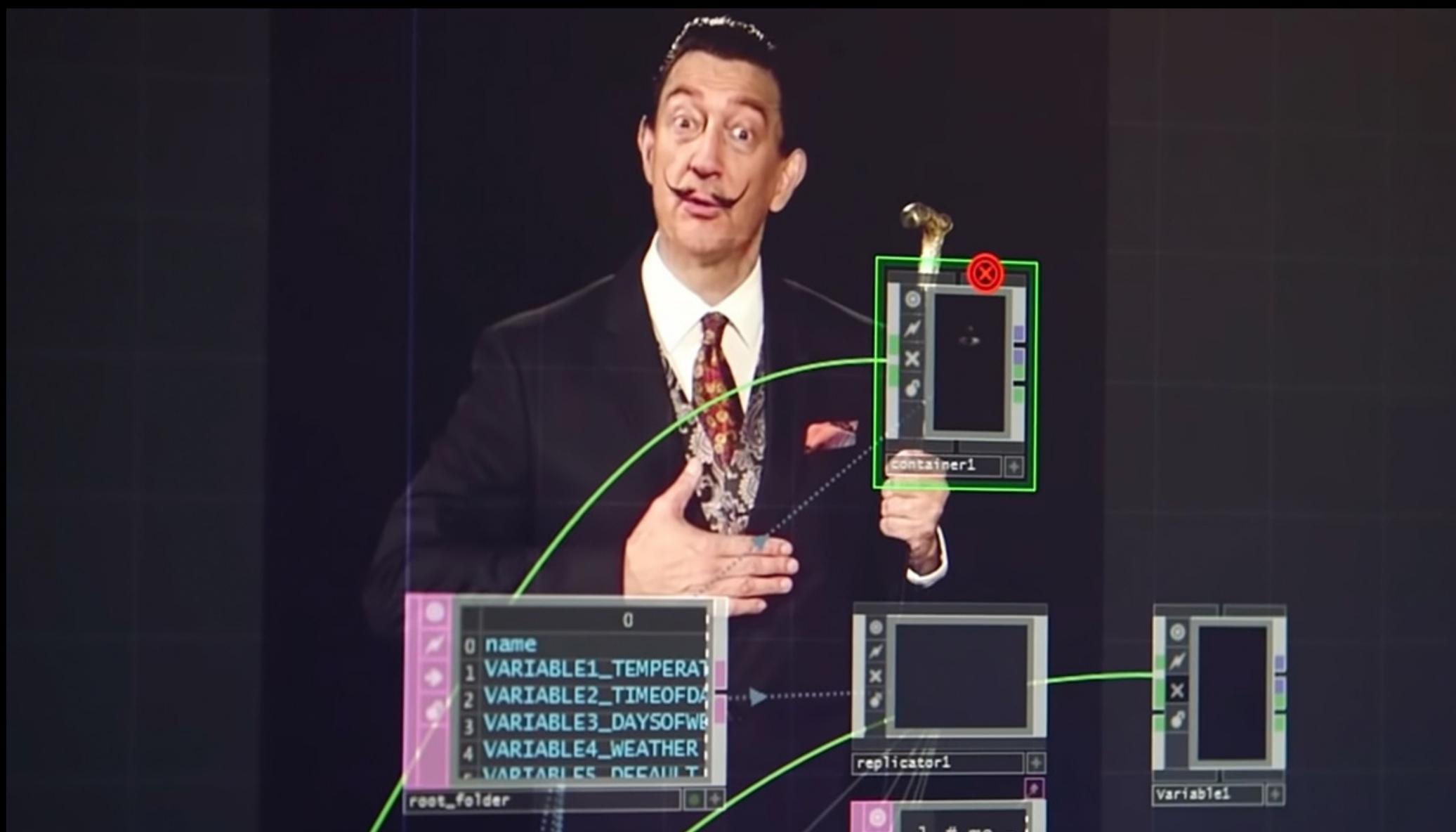
08

→ Dalí lives



Dali Lives – Art Meets
Artificial Intelligence.
May 11, 2019
The Dali Museum, St.
Petersburg, Florida

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DALÌ LIVES PIPELINE

TouchDesigner and Python

Video: 6,000 frames and over 1,000 hours of processing

Text: Dalì's quotes

Result: 45 minutes of new footage, spanning 125 videos

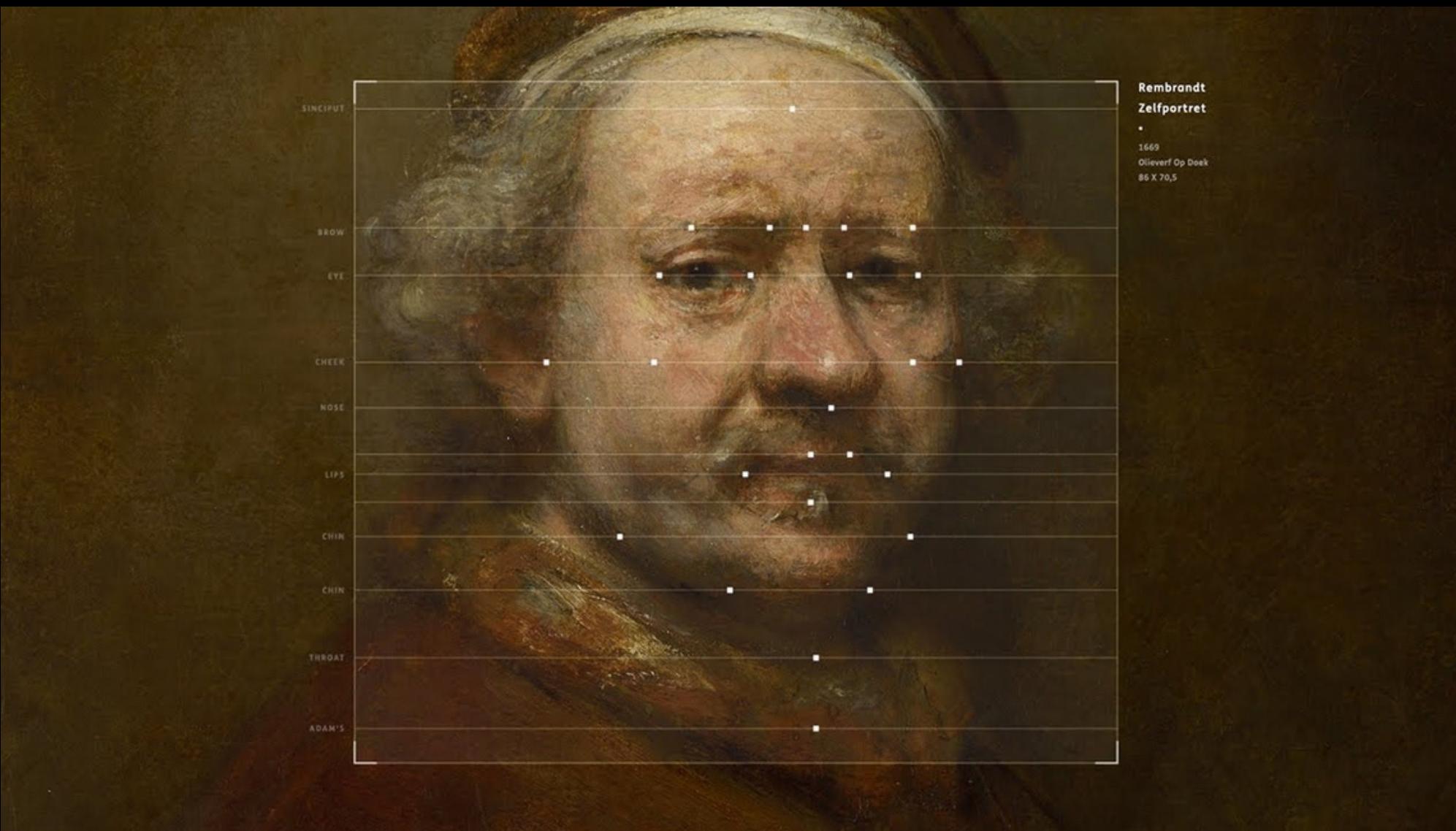
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→ The next Rembrandt



The Next Rembrandt
2016
ING / Microsoft / TU Delft /
Mauritshuis / Rembrandthuis

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NEXT REMBRANDT PIPELINE

Data collection: 346 paintings with high-resolution scans

Target: 30-40 years old, male, wearing black clothing, a hat and facing the right

Features: facial landmarks, 'typicalities' of geometries, style, texture

Print: Canon high-end, custom-made 3D printer

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CHALLENGES

Creation

Generalization

Rendering of expressions and mannerisms

Identity leakage

Rendering of hair, hands, teeth, shadows

Occlusions

Bias towards frontal pose

Temporal coherence

(Mirsky and Lee, 2020).

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DISCUSSION

Can deepfakes even be considered art?

Ectype: (Greek) a copy that has a special relationship with its source linked in an authentic way to its source (Floridi, 2018)

How: technologies separate archetypal source from the artifact
either authentic in style and content (Next Rembrandt)
or original in the source (In Event of Moon Disaster, Dalí Lives)



CONCLUSION

MEDIA LITERACY IN THE AGE OF DISINFORMATION



Deepfakes are certainly a pressing issue

It is nonetheless important to look at some positive applications:

- metacritique and pedagogical deepfakes
- new forms of art
- engaging curatorial technique

REFERENCES

Papers:

- Mirsky, Y., & Lee, W. (2020). The Creation and Detection of Deepfakes: A Survey. arXiv preprint arXiv:2004.11138.
- Kietzmann, J., Lee, L. W., McCarthy, I. P., & Kietzmann, T. C. (2020). Deepfakes: Trick or treat?. *Business Horizons*, 63(2), 135-146.
- Floridi, L. (2018). Artificial intelligence, deepfakes and a future of ectypes. *Philosophy & Technology*, 31(3), 317-321.

General on deepfakes:

- <https://en.wikipedia.org/wiki/Deepfake>
- <https://www.theguardian.com/technology/2020/jan/13/what-are-deepfakes-and-how-can-you-spot-them>

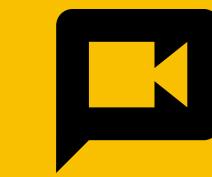
Case studies:

- <https://moondisaster.org/>
- <https://www.youtube.com/watch?v=luygOYZ1Ngo>
- <https://www.youtube.com/watch?v=p1b5aiTrGzY>
- <https://www.youtube.com/watch?v=BIDaxl4xqJ4>

EXTRAS 1

→ Talking Heads: Few-Shot Adversarial Learning

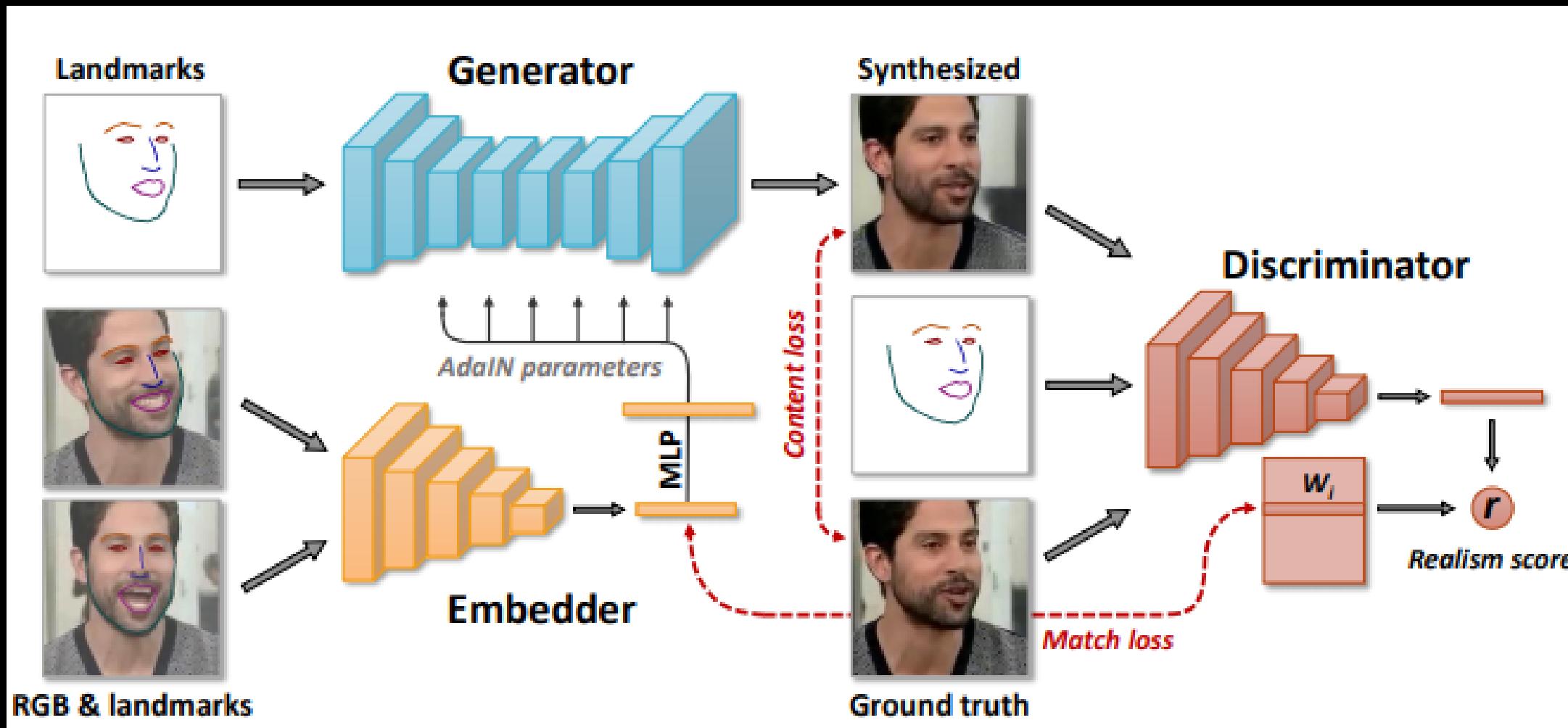
Living portraits



Ivan Kramskoy's Portrait
of Unknown Woman

Da Vinci's Mona Lisa

EXTRAS 2



TALKING HEADS PIPELINE

Landmark extraction

Meta-learning on Vox dataset

Few-shot learning on a few images

Matching with suitable landmarks